OVERVIEW AND LESSONS LEARNT FROM THE PLANNING AND ROLLOUT OF THE GO GEORGE IPTN

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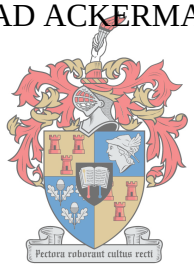

Mini-thesis presented in partial fulfilment of the requirements for the degree Master of Philosophy in Urban and Regional Science in the Faculty of Arts and Social Sciences at Stellenbosch University.

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March 2018

DECLARATION

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Date: 31 October 2017

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List of Abbreviations

- BOC: bus operating company
- BRT: bus rapid transit
- CBD: central business district
- DoT: Department of Transport (National)
- IRPTN/s: Integrated Rapid Public Transport Network/s
- IRT: Integrated Rapid Transit
- ITP: Integrated Transport Plan
- LTA: Land Transport Act, 2009
- NHTS: National Household Travel Survey
- NLTSF: National Land Transport Strategic Framework
- NLTTA: National Land Transport Transition Act, 2000
- PPP: Public Private Partnership
- RSA: Republic of South Africa
- SA: South Africa
- TOICS: Taxi Operator Investor Companies
- GIPTN: George Integrated Public Transport Network
- GG: Go George
- MTS: Mass Transit Systems

CHAPTER ONE: INTRODUCTION

1.1. INTRODUCTION AND BACKGROUND

Bus Rapid Transit (BRT) is increasingly praised by scholars as the answer to the problem of easing the pressures of urban congestion without straining fiscal budgets. BRT—shorthand for a system of bus-based public transport with improved capacity, reliability and cost-efficiency—originated in Curitiba, Brazil, where urban planners required fast solutions to the combat the effects of a rapidly expanding urban population in the 1970s. At first suggestions of improving rail networks and implementing a subway system were promoted, but this was both too costly and would take decades too long to complete. It was Jamie Lerner, an architect and the city's mayor, who focused on the humble bus—considered a bygone form of public transport by many at the time—and who sought to redevelop the bus-system to match the practical advantages offered by rail (Reed: 2015). BRT increasingly evidenced its potential to outperform alternative systems, including rail, particularly in terms of cost-efficiency (Pacione: 2009); indeed, by 1993, Curtiba's BRT system serviced some 1.5 million passengers a day while continuing to improve its efficacy (Reed: 2015). This comparative efficiency was achieved in two ways: firstly, dedicated bus lanes mean that buses can move at a consistent speed on par with Light Rail Transit (LRT) and are not subject to the irregularity and chaos of conventional traffic; secondly, passenger load times are significantly reduced through methods, which can include off-board payment and station design (Wright & Hook: 2007).

Curitiba's transport innovations soon gained attention—first from other countries in South America, notably Columbia, and then the United States, China, Turkey and South Africa. There is variation, however, as BRT systems are necessarily adapted to individual cityscapes. While some argue that its defining features include dedicated bus lanes, off-board fare collection, bus priority signalling and platform level boarding; others prefer a looser working definition. Many prefer to define BRT simply as a public transport system providing higher capacity, reliability and cost-efficiency than alternative transport models. The adoption of BRT increased dramatically from 2002; indeed, while 23 cities implemented some form of BRT between 1992 and 2001, BRT systems were introduced in over 115 cities between 2002 and 2013 (EMBARQ: 2013). Highlighting the swift proliferation of the scheme, Dario Hidalgo and Luis Gutierez (2012) note that of the 99 countries that adopted BRT over the decade (2002–2012), 19

completed BRT integration in 2010–2011 alone. As of October 2017, Global BRT Data estimates that an average of 32 million people make use of BRT daily, with the system integrated in at least 165 cities across six continents. Moreover, Hidalgo and Gutierez add, 16 of the more recent countries to adapt BRT are in the 'Global South' (2012).

The evident success of BRT has been complemented by praise from academics and policy-makers who note the time-saving, health and safety benefits of the scheme. A 2013 study by EMBARQ, an international think tank centred on sustainable urban mobility, noted that the reliable and relatively time-efficient service provided by BRT saved commuters in Istanbul an average of 52 minutes each day, while Mexico City recouped up to US$ 141 million in economic productivity. Meanwhile, areas where BRT systems had been successfully integrated showed a 40% reduction in traffic related injuries; other health benefits of BRT are thought to include less exposure to air pollution, an increase in individual physical activity, and less environmental damage due to lower traffic congestion (EMBARQ: 2013). Together with cost-efficiency, such elements certainly proved attractive to South African policymakers, as the BRT model was chosen to underpin the revision and development of the public transport systems in country's major cities, Johannesburg and Cape Town, in advance of the 2010 FIFA World Cup.

Examining the implementation of the first phase of the so-called Rea Vaya BRT transport system in Johannesburg, EMBARQ noted that while the system had shown success in reducing the average travel time of commuters and improving road safety, only 4% of low-income citizens benefited from the scheme. The latter is thought to be due, in part, to the ways in which the country's apartheid past continue to shape population density and mobility. Certainly, academic work on the implementation of BRT in South Africa—including that of Walters (2008) and Wilkinson, Behrens and Schalekamp (2010)—has emphasized the ongoing effects of socio-economic disparities on the country's urban landscapes. Karen Lucas (2011), for example, explores the access to and use of public transport among low-income groups, arguing that it is these groups who have a greater dependency on accessible, reliable and cheap public transport for their livelihoods. Since the late 1980s, minibus-taxis have answered this need, and this informal transport industry remains one of the largest challenges to the successful implementation of BRT in South Africa. As Wilkinson, Behrens and Schalekamp have shown, the minibus-taxi sector has become the dominant public transport provider (2010). With 70% of those dependent on public transport relying on minibus-taxis, the South African taxi industry

is estimated to employ 185,000 people in 2013—a workforce that was 95% black and 98% male. Although minibus-taxis provide an on-demand service, it is unreliable and of low quality with poor vehicle maintenance and little to no infrastructure (including the provision of taxi ranks, stations and shelters or route maps and timetables). Moreover, it is steeped in violent competition rooted in the 'taxi wars' of the 1990s, during which competition for limited permits led to hundreds of deaths (EMBARQ: 2013). The goals of current BRT initiatives focus on unifying the public transport system with paratransit networks like that provided by the minibus-taxi industry. While this would make administration, management and implementation easier and more effective, there is formidable opposition from the latter, who argue that BRT models pose a significant threat to their livelihoods (Schalekamp, Behrens & Wilkinson: 2010).

As illustrated in this thesis, the practical implementation of BRT systems in South Africa, particularly in areas with greater socio-economic disparity, is necessarily 'highly context specific' (Schalekamp, Behrens & Wilkinson: 2010). Consideration of the local context and flexibility for in situ adaptation are essential for any effective development of public transport systems in the country. With this as its core premise, and using the Western Cape municipal district of George as its case study, this paper seeks to determine the extent to which these socio-economic factors have been considered in the development of a BRT system and the local dynamics that have affected its integration.

1.2. PROBLEM STATEMENT

Successfully implemented in countries around the world, BRT models have provided a low-cost, reliable and effective form of public transport that has aided in bridging socio-economic gaps while benefiting public health and easing environmental pressures. As such, BRT has worked to advance the pursuit of a compact city model; that is, the promotion of high population density and mixed land use while seeking to reduce energy consumption and pollution in city planning. Such impacts are particularly clear in South American countries, with over 19 million people making use of BRT each day (Global BRT Data: 2017). Indeed, in Curitiba, Brazil, the *Rede Integrade de Transporte* currently services an average of 2.2 million users per day, while the *Trans Milenio* in Bogotá, Columbia, serves 2.1 million daily (hidalgo & Gutierrez 2012) However, while literature on the BRT models in these regions have praised its efficacy and knock-on effects, the South African outlook is decidedly less positive.

In its current state of implementation in South Africa, BRT has been met with criticism and shaped by conflict, failed negotiation and long periods of stagnant development. Consequently, South African literature on the subject has centred on critiques of BRT-based policy changes and developments, emphasizing tensions between current paratransit networks and proposed Integrated Rapid Transit (IRT) systems), and the ongoing ramifications of historic social exclusion on shaping public transport in the country. Moreover, academic analyses are metro-centric, and there is a proportionate lack of information surrounding micro-regional dynamics in the reproduction and integration of BRT models in South Africa.

Arguably, the recently implemented George Integrated Public Transport Network (GIPTN), popularly referred to as Go George, marks a departure in the pattern of public transport development in the country. Conceptualised in 2003, this transport network project aimed to address multiple issues, including: the need for urban integration, the rejuvenation of the city centre, increasing corridor development and improving social mobility (Daniels & Aboo: 2016). This micro-scale IPTN is also the first to engage negotiations with the local paratransit sector, attempting to elicit the participation of the George taxi-minibus industry in the project and its aims from 2007. While George was the first non-metropolitan area to attempt this, the project was later put on hold due to the prioritising of funding for the 2010 FIFA World Cup. Eventually launched on 8 December 2014, GIPTN was met with mixed reviews: while headlines like ‘Go George a huge hit’ marked its infancy, this honey-moon phase appeared to end abruptly as negotiations with the local taxi industry rapidly began to devolve (Frankson: 2015). In August 2015, four Go George buses were set on fire by protesting taxi drivers, initiating a shutdown of all bus routes and a heavy police presence to restore order—the unrest ignited by the initiation of a trial-route in Thembalethu, the lowest-income area in the George municipality (Schoonraad: 2015). Indeed, as shown in the paper, Thembalethu remains outside the scope of the GIPTN to this day.

Consequently, this paper seeks to explore the origin and planning of the IPTN in George, as well as the anticipated experiences and expectations associated with its roll-out. Taking the forward planning by local authorities in determining the location and operation of the GIPTN into its consideration, this study unpacks how these considerations shaped its design. In doing so, this paper situates its discussion of the GIPTN in the current literature regarding urban planning and land use, including the need to consider the socio-economic profiles of users in

proximity to stations or stops. In studying the GIPTN's planning, objectives and roll-out, this paper sheds light on the elements impacting the successful implementation of such schemes while promoting the need for flexible and adaptable models due to local dynamics. It is hoped that such a discussion will prove illuminating for the future implementation of such systems in towns and cities in South Africa.

1.3. RESEARCH QUESTIONS

I. How does the GIPTN system differ from other BRT-type systems in other cities in the Global South?
II. What is the historic motivation for the implementation of an IPTN in the George municipality?
III. Did any forward planning take place during conceptualization of the GIPTN regarding the development of land uses adjacent to the bus routes?
IV. What does the current Spatial Planning Policy say regarding the development of land uses adjacent to the bus routes?
V. Since 2014, have there been any short-term or immediate land use responses to the newly implemented bus routes?
VI. What are the current socio-economic characteristics of the population having closest access to the GIPTN infrastructure?

1.4. HYPOTHESIS

The GIPTN has been hindered to a large degree by failure to conclude discussions and minimize the tensions between its multiple stake holders. The social profile of the GIPTN users will reveal that a substantial part of the GIPTN's target market has been excluded from benefits because of this issue.

CHAPTER TWO: LITERATURE REVIEW

2.1. INTRODUCTION TO THE LITERATURE REVIEW

Literature on BRT is broad in scope and varied in perspective. In providing an overview of prominent themes in BRT scholarship, this literature review seeks to illuminate the practical and conceptual dynamics involved therein, and to provide greater insight into its design and deployment of the IPTN in the George municipality. To achieve this, this literature is composed of five sections. The first of these explores the definitional parameters of BRT, looking at the qualifiers posited by various scholars and how these relate to the GIPTN studied in this paper. The second section looks at analyses of the technical and operation performance of BRT, including the measurement of its comparative benefits and fiscal value compared to other transport systems, such as rail, as well as different BRT models. Thirdly, and significantly for the purposes of this paper, this literature review provides an overview of literature regarding land use and its inherent value to the promotion and definition of BRT systems. The fourth section looks more closely at the impact of BRT in the South African context, particularly regarding the paratransit sector. By doing so, this section reflects on common scholarly emphases, including how the focus on environmental impact, forward planning and framework policy inherent in the BRT model have been used to promote socio-economic objectives. Finally, this literature review provides an overview of the development of the IPTN in George.

2.2. THE DEFINITIONAL CONSTRAINTS OF BRT

As noted, the popularity of BRT models has grown exponentially over the last fifteen years; however, these systems vary considerably from country to country. Indeed, while BRT systems have proliferated in Europe they are often designated as Buses with a High Level of Service (BHLS) (Hidalgo & Muñoz: 2014). This is largely because there remains no single definition of BRT (Weinstock et al: 2011). Consequently, a significant portion of scholarship has focused on identifying and categorising the key design concepts and characteristics of BRT. Thus, while there is no unifying definition of BRT, analysts have come to agree on several commonalities—a ‘high-quality’ bus-based transit system that is capable of being a fast, efficient and cost effective mode of public transportation. As exemplified by the work of Wright and Hook (2007), as well as Rodriguez et al (2003), these systems are characteristically

frequent, punctual and consistent—making them identifiable and 'distinct' brands with significant public trust (Wirasinghe et al: 2013).

Some scholars have sought to extrapolate general adaptations from case-studies, or through cross-comparisons with other forms of public transport. Xu and Zheng (2012), for example, look at BRT and spatial efficiency—that is, how the system utilises pre-existing infrastructure like roads—in exploring what facilities are necessary to designing, adapting and maximising the benefits of functional BRT models. Here they conclude that there are three optimal road configurations for BRT, namely on-street, off-street, and freeway. To this they add that some systems would benefit from a curb bus-only lane (dedicated bus lane), while others would be better served from median busy-only lane (dedicated bus lane at certain times of the day) (2012). Such facilities, Xu and Zheng argue, would aid to maximise the benefits of BRT regardless of country specificities. Alternatively, Currie (2005) examined BRT from the perspective of the passenger, exploring the attractiveness of the bus as a mode of urban transport by comparing it to other models, such as rail. Such an approach has yielded interesting results and a categorisation of the BRT model based on the perception of its users as providing interactive, multi-use spaces (Currie 2005). Despite such attempts to codify its characteristics, BRT covers a broad range of technical specifications and operational outcomes. This has prompted scholars like Stokenberga (2014) to argue that definitional parameters must consider the diverse manifestations of BRT across the world and the differences in operational and technical characteristics from one context to another.

Nonetheless, as illustrated in Table 2.1.1 below, Levison et al (2003) provide a working-definition of BRT which involves seven distinct components that are integral to the functioning and efficacy of most BRT systems.

Table 2.1.1: Components of a BRT System

COMPONENTS OF A BRT SYSTEM	
Lanes	• The vehicles operate primarily in exclusive transit ways or dedicated bus lanes. • Vehicles may also operate in general traffic. • BRT stations range from enhanced shelters to large transit centres.
Vehicles	• Quiet operation. • High capacity. • Cleaner fuel or hybrid style engines. • Environmentally friendly.
Stations	• Bus stop shelters. • Raised platform shelters. • Large transit centre stations.
Services	• High frequency, regular service intervals. • Integration of various service types, which can reduce long distance travel.
Route Structure	• Simple and easily understandable route structure. • Colour coded.
Fair collection	• Fare collection usually performed before boarding. • Some BRT systems allow multiple door boarding procedures to decrease loading time and increase system efficiency.
Intelligent Transportation Services	• Vehicle tracking. • Passenger handling and information systems. • Traffic grid integration into system, this provides optimum flow dynamics through traffic signal preference.

Source: Levinson et al: 2003

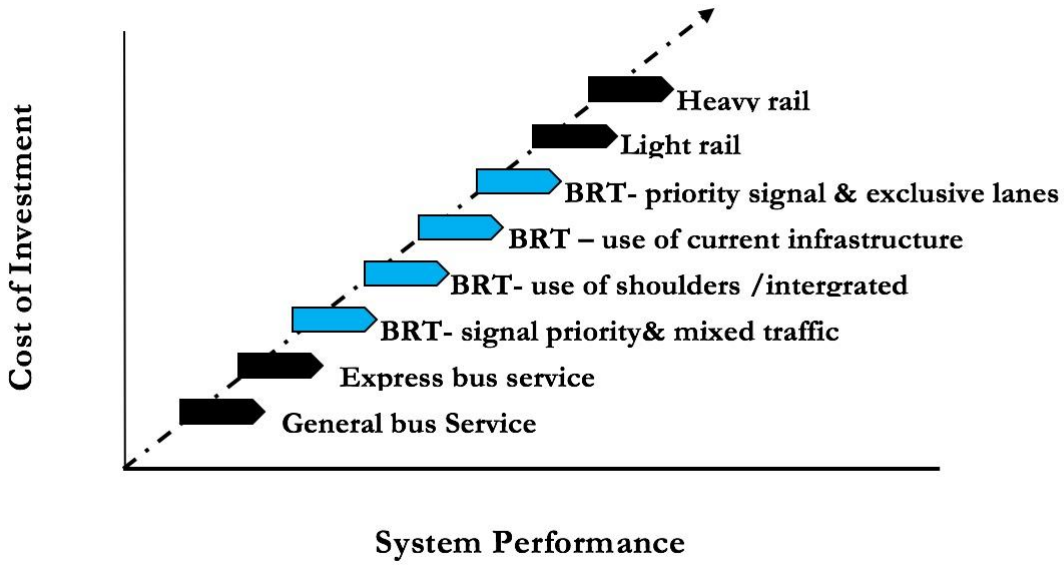
Similarly, Diaz and Schneck (2000) argue that BRT systems can be distilled into six integral elements: running ways, vehicles, stations, fare collection systems, operational control systems and passenger information systems. Consequently, and for the purposes of this paper, BRT systems can be defined as integrated packages composed of several rapid transit elements. Together these components work to guarantee the efficiency, reliability and affordability of the BRT system (Deng & Nelson: 2011).

While the Go George bus service has the features and objectives of the BRT model, it classifies itself as an IPTN. In many respects, the differences between the two are nominal; however, where the BRT makes use of a dedicated bus lane, IPTN systems also seek to utilise and integrate other modes of public transport into its ambit—including the paratransit sector (Go-George: 2017).

2.3. BRT PERFORMANCE ANALYSIS

In addition to studies of characteristics, system attractiveness, and cross-comparisons with other transport modes, a significant body of scholarship looks at the viability and impact of BRT on ridership and urban development. Literature regarding the performance of BRT systems is broadly divided between examinations of technical performance on the one hand, and operational performance on the other. In a 2014 review article on performance-based scholarship, Stokenberga showed that BRT can improve urban mobility to the same degree as rail-based systems, the more expensive transport alternative and yardstick by which BRT is routinely measured. Decidedly more contentious in this literature is the question of which characteristics of BRT are responsible for the successes or failures of its implementation in varying contexts (Stokenberga: 2013; Deng & Nelson: 2011). Answering this question is essential to gauging the current and future demand for transit services, as well as the planning and design of urban landscapes that ensure residential access to identified BRT corridors (Stokenberga: 2014). Moreover, the combination of the individual characteristics of a BRT model are a key-determinant of ridership—shaping whether the system's main users will be urban residents, incoming short-term labour from outside the urban sphere, or tourists (Currie: 2005).

The primary motivation of performance- or outcome-based analyses is measuring the cost effectiveness and rate of return on investment in BRT. An adapted version of Cain et al's graph on cost and system performance—Figure 2.3.1 below—illustrates how optimal BRT models are contingent on the other modes of mass urban transit available.



Source: Cain et al: 2009, p. 3

Figure 2.3.1: Relation between investment costs and BRT system performance

Furthermore, Figure 2.3.1 indicates some of the BRT models currently in use across the globe, and underscores the ability of the model to be adapted to contextually specific needs. Indeed, Deng and Nelson (2011) emphasise the value of Figure 2.3.1 in their own work, which attempts to estimate the average cost of mass transit systems by comparing BRT models in the US per mile with alternative transport types, including LRT and Metro Rail Transit (MRT, or heavy rail).

Despite the utility of Figure 2.3.1 in illustrating why BRT continues to be an attractive option in urban transit development, Wirasinghe et al (2013) correctly point out that it cannot account for various exogenous factors that impact the cost of investment. Infrastructure costs vary greatly and are shaped by local requirements and costs, including: the cost of land acquisition and station design, the degree of integration or separation from main traffic, level of technological sophistication, the effects of local policy (particularly that influencing fiscal incentives), as well as the cost of labour and materials (Diaz & Schenk: 2001). As such, capital and investment costs should not be generalised. Wirasinghe et al (2013) conclude that the specifics of the operational performance of BRT systems are vital to this research, though they remain relatively overshadowed by analytical emphasis on technical aspects. Indeed,

performance-based literature is separated as much by the context of individual research environments as the variables upon which the performance-analysis is measured.

2.4. BRT, LAND USE AND PROPERTY VALUE

Writing in 2004, Rodriguez and Targa declared the utilisation of land an undervalued and unexplored aspect of BRT research. This field of inquiry has changed significantly over the last decade, however, with burgeoning interest in the optimisation of land utilisation and investment in mass transit debates. Whilst having much in common with other mass transport systems, BRT models tend to have a measurable impact on the development of land parcels surrounding the various axes of the system. The positive impacts of mass transit on land development is now widely accepted, the knock-on effects of BRT and similar models on the socio-economic infrastructure, environment and physical health increasingly well-documented. Indeed, in their paper on the effects of BRT on land development, Levinson et al (2002) found that similar positive outcomes—comparable to LRT—were observable in a variety of regions in Japan, the US and Australia. A primary benefit of such transport networks—which are composed of a busy network of nodes and corridors—is that they increase the value of surrounding land, attracting prospective developers and shoring up investor confidence (Zimmerman & Levinson: 2004).

Urban planners must consider multiple factors in deciding which public transport systems are best suited to developmental objectives as well as which will attract the desired investment in the long-term—although such decisions are often politically motivated and operational trajectories can be considerably shortened as a result (Polzin & Bates: 2002). Indeed, a common feature of BRT analyses are the bureaucratic obstacles hindering land use change; this is certainly an issue facing the practical implementation of IPTN projects in South Africa. In terms of bureaucratic barriers in the country, disjuncture and miscommunication between municipal, provincial and national departments is prominent—resulting in substantial delays and periods of stagnancy. In the instance of the George IPTN, discord between various players—the Western Cape government, George Municipality, Go George Vehicle Operator Company (VOC) and the minibus taxi industry—resulted in the suspension of plans to implement operations in the Thembalethu area. There have been several attempts at implementing mass transit system in South Africa, many of which have resulted in failure—including the recently mooted plans to introduce a light rail service in Cape Town.

Nevertheless, a recurring theme in BRT literature is that the adoption of such systems is predicated on the ability of BRT to gain basic functionality at a low cost and then entice further investment. Polzin and Bates (2002) argue that the key-consideration in proposals for new transit networks is its potential to create investment interest as well as influence land use and property values in and around the urban system. In the case of the George IPTN, as well as similar networks in South Africa, a phased roll-out is typically preferred—usually due to funding or physical constraints. As a result, it is often assumed that earlier phases of development within these systems act as a showcase to encourage further capital investment. The inherent flexibility of BRT enhances its attractiveness for urban policy-makers and investors alike. Unlike rail, for example, BRT systems are suitable for both high and low population density areas, can utilise pre-existing transport infrastructure, and are more adaptable to changing weather conditions (Cervero & Kang: 2011). Targa and Rodriguez (2004) argue that this is what makes the BRT model, and its variants like IPTN, so flexible—a malleability that is both a strength and a weakness.

It has been amply demonstrated in urban studies that the average travel time and distance of commuters, together with the efficacy and affordability of modes of transport, are key-determinants in shaping residential, retail and industrial spaces. Consequently, the reduction of commuter times has been a fundamental aspect in the design of modern mass transport systems. Moreover, the areas surrounding transit systems have increased in value and developer interest, which is further evidenced by the growth of competitive property markets and bids—particularly around transit stations and in lower income areas with a high population density, where reliance on public transport networks is greater. This is to say, the combination of commuter routes between residential and business locations, a competitive capitalist environment, and the cost-saving benefits of mass transport systems results in raising the value of these areas—particularly locations of transport exchange points (or nodes). Underscoring this, various BRT models have been shown to aid in the creation of high-density urban environments. Canada's Ottawa Transit Way, for example, generated developments worth more than US$ 670 million around its transit stations (Levinson, Zimmerman & Clinger: 2003). Similarly, as Kittleson et al (2007) show in their study of residential land along the BRT corridors in Boston, properties closer to routes and nodes were markedly higher in value than those further away. As such, current scholarship has done much to address the relationship between mass transport systems, land use and property valuation.

Land use and changing land values are inherently connected in BRT literature. This relationship is evidenced throughout BRT scholarship. Cervero and Kang (2011), for instance, explored the ways in which land use and values were altered by the implementation of BRT systems; similarly, Kang (2010) used the locations of various industries to examine the types of stops used in BRT systems. The work of Rodriguez and Targa (2004) provides ample evidence of increased residential land value of properties with greater access to stations. Their examination of residential properties located within a 1.5 km buffer zone around station nodes of the *Trans Milanio* in Bogotá revealed that property prices had increased by 6.8–9.3%. An interesting aspect of this study was the authors' attempts to account for exogenous factors that may have influenced these results; nonetheless, their results showed significant positive change in property values and land use adjacent to the stations and various nodes of the BRT network in the first two years of its operation. In their examination of BRT in Beijing, Deng and Nelson look at the ways in which land use and associated changes in land values are influenced by other factors. This marks a departure from other approaches on this topic, which typically understand changes in land use and value as a product of mass transit systems (2010). This could be a valuable approach for South African researchers in analyses of the numerous public transport projects currently in development—especially in enhancing financing schemes prior to implementation, an area of concern in the country (Schalekamp, Behrens & Wilkinson: 2010).

2.5. COMPENSATION POLICY IN SOUTH AFRICA

A primary driver of regulatory reform in South Africa has been the acceptance—however reluctant at times—of the inevitability of structural change in the passenger transport sector. A significant aspect of this is the emergence and consolidation of the minibus-taxi industry as a major mode within the road-based public transport sector, and the subsequent recognition of the advantages of the competitively priced and demand-responsive nature of its informal operational practices. South African BRT-related scholarship shows a consistent interest in the policy environments and compensation models used in the implementation of IPTNs in the country. Walters (2012), for example, examines transport-related policy in South Africa, specifically that related to public transport and its impact on policy change. This is because the current approach of the South African government is based on compensating sectors that experience loss of income as a direct result of public transport development. This method is

promulgated to expedite negotiations with affective parties and enhance the chances of unchallenged and uninterrupted roll-out of public transport projects (Robertson :2017, Pers com) The governmental approach seeks to circumvent potential challenges and industry competition by promoting interest in new bus VOCs through share-focused remuneration schemes. Ideally, this is achieved by compensating affected minibus-taxi operators with shares in the VOC, and thus increasing a mutual interest in seeing IPTN schemes successfully implemented (GIPTN: 2017). However, as Von Heyden, Hastings and Leitner (2012) have argued, this compensation model is neither sustainable nor viable given the peculiar dynamics of the South African public transport industry. Policy and implementation models have been pivotal to much of the critique of recent integration of public transport services in South Africa, particularly regarding expenditure. This has been made abundantly clear by press coverage, with headlines like 'Bus Rapid Transit Bleeding Cash' announcing that the supposedly low-cost public transport networks were proving significantly more expensive than estimated (City Press: 2017).

From the outset, the integration of BRT models in South Africa has been plagued by disagreements between the public and private sectors regarding what compensation models should include, as well as by the structure of future-orientated business models. Walters has suggested that more focus should be placed on the outcomes of policy implementation through analytical techniques such as the Ambiguity-Conflict model, which attempts to determine which directives are best suited to the successful implementation of BRT schemes (Walters: 2012). Noting that the industry involves a variety of individual players—each with their own ideas, aims and goals—von der Heyden et al suggest that the industry be categorised in two groups: those who offer direct public transport service on the one hand, and those who provide support through indirect means and services (von der Heyden, Hastings & Leitner: 2014). Venter (2014) argues that successful transformation is indicated by the inclusion of taxi operators, identifying their participation as a recognition of market saturation and declining prospects of future growth. Through this 'life-cycle' approach, Venter attempts to draw attention to aspects of planning and management for the successful implementation of public transport systems in South Africa. However, consistent difficulties in concluding negotiations and contracts—evident in the case of the Go George and My Citi (Cape Town) operations—weakens this position significantly. Schalekamp, Behrens and Wilkinson (2010) argue that regulatory frameworks provide no clear solution to address tensions between the government and existing transport sectors. Moreover, the various conflicts and 'shifting dynamics' between

local and national spheres has influenced the degree of meaningful engagement between the government and paratransit sector (Schalekamp, Behrens and Wilkinson: 2010, p. 786). Thus, to address issues of compensation, structured discussions and negotiations are necessary at multiple levels. Walters (2012) has described the dissemination of transport policy as oppressive and top down in approach—one not ideally suited to the informal, largely ungovernable nature of the paratransit industry.

Constrained by the high cost of rail transit, BRT is considered an immediate, practical and affordable solution to traffic congestion and individual mobility in cities across the word. As a relatively new mode of rapid transit, the full impact of BRT remains largely unexplored—although it is increasingly clear that it has multiple benefits for land use and value. The main attraction of BRT to policy-makers is that it is a cost-effective means of moving large numbers of people at a consistent, regular timetable. Although BRT systems are also cheaper to implement than rail, they are capital-intensive nonetheless. Like other forms of mass transit—such as metro and LRT—BRT can add capacity to the existing transport corridor and significantly reduce commuting times; thus, locations near BRT stations tend to have a high level of accessibility and become optimal areas of development. Consequently, is widely accepted that a full-feature BRT system has numerous positive knock-on effects on the socio-economic and practical urban landscape.

2.6. TRANSPORT POLICY AND IPTN IN GEORGE

The introduction of BRT systems in South Africa resulted from numerous regulatory reforms to transport policy. The Department of Transport's 2007 'Public Transport Strategy' and 'Action Plan' proposed the schemes, while the reformed National Land Transport Act of 2009 granted smaller metropolitan areas opportunities to gain the financial support necessary to implement their own public transport initiatives. Essentially, these 2007 documents outline the government's planned approach and operational guidelines to reforming the existing bus infrastructure and the public reliance on the minibus-taxi industry (South Africa: 2007; 2009). A chronological overview of transport-related regulatory reform from 1996 and 2000 is provided in Table 2.6.1 below; important policies, acts and developments in the provision of road-based public transport services is also provided.

Table 2.6.1: Summary of Transport Policy Framework

YEAR	POLICY FRAMEWORK
1996	**White Paper on Transport Policy** • Established ideals of competitive tendering for subsidized service operation in the transport industry. • Aimed to create a more open market. • Capable of including previously disadvantaged operators. • Tendered contracts helped to alleviate financial constraints suffered by existing operators.
1997	**Conclusion of Interim Contracts** • Attempt to formalize existing paratransit industry through introduction of a contractual framework. • Operators gained the time needed to create a formal business structure, which were legally able to tender competitively for operational rights. • Valid for 3 years or until services of that contract where reoffered as a tender.
1998	**The Moving South Africa Strategy** • Provided an overview, vision and recommendations regarding the `plans for multi model transport. • Established the corridor driven focus, densification, and optimization of model dynamics. • Encouraged competition in the industry through private interest concession.

2000	**The National Land Transport Transition Act (NLTTA)**
	• Enacted in 2000, the Act defined the expected functions of government at all levels for the effective management of public transport operations.
	• Made provision as to how transport authorities were to oversee public transport.
	• Laid out guidelines for the administrative handling of competitive tendering in the industry.
	• Provided for Integrated Public Transport Planning
	  • Integrated public transport planning was required within the competitive tendering process.
	• Suspension of competitive tendering (2002).
	  • This was due to continued tensions between the Department of Transport, paratransit (Bus and Taxi) operators and the SABOA.
	  • Completive tendering was proving a costly approach for a financially for the State.
	• Required the establishment of a National Land Transport Framework.

Source: Schalekamp Behrens and Wilkinson: 2010; South Africa 2007 & Walters 2010

As noted in Table 2.6.1 (above), the GIPTN originated from a corridor rejuvenation scheme known as the Sandkraal Road Corridor Mobility Strategy. Soon after the initiation of this

strategy in 2003, however, the need for public transport in the broader urban area became increasingly apparent. This was only economically viable at first, with reform to transport policy directing policy towards an IPTN. Though slow in their introduction, these directives emerged from the Moving South Africa Strategy, which—as noted in Table 2.6.1—focussed on corridor development and densification strategies. In 2000, the NLTTA was released and made significant changes to the ways in which the public transport industry operated, by providing the necessary groundwork for later transformations in the sector. Alterations to the vision of public transport in South Africa were reflected in the decision to start investigating the possible implementation of an IPTN in George in 2005—this would be the country's pilot IPTN. Policy reforms after this date were vital to the success of the project. Negotiations with the minibus-taxi industry finally concluded and a recapitalisation programme was initiated in 2006—setting the benchmark for a lengthy negotiation period between IPTN project managers and the local paratransit industry in George. However, consultations regarding the proposed introduction of a public transport system in the city were side-lined in advance of the 2010 FIFA World Cup, as national and provincial priorities shifted towards completing transport systems in country's host cities. Table 2.6.2, below, provides a brief overview of the timelines of the GIPTN project, as well as the policies that enabled its implementation. Interestingly, the GIPTN was ideally located in terms of its planned implementation and the reform of national transport policies.

Table 2.6.2: Overview of the GIPTN Project

YEAR	POLICY INTRODUCED	GIPTN PROJECT
2005		**Concept and strategy Phase of GIPTN** • Scope of Project. • Surveys and Studies: Travel, MBT studies and financial analysis, and economic viability assessments conducted in George.
2006	**Taxi Recapitalization Program**	**Engagement phase GIPTN**
	• Deterioration of the MBT industry's vehicles was unmanageable. • Discussions led to an agreement between the Department of Transport and SANTACO to scrap roadworthy vehicles and replace them with new vehicles in line with the National Standards for the Conveyance of Passengers.	• Industry engagement in George commenced; this included a public consultation period. • The engagement period lasted until 2007.
2007	**The Public Transport Strategy** • New directives for public transport management. • Provisions made for the introduction of BRT type systems. • Multi Model upgrade plan was put forward and accelerated. • Introduced the Integrated Rapid Public Transport Network.	• Negotiations and discussions with industry and the public continued.
2009	**The National Land Transport Act (2009)** • Replaced the NLTTA (2000). • Importantly for the GIPTN, this Act dissolved the authoritative powers regarding public transport to the municipal level of government. • Created to the requirements of an IPTP.	**Planning Phase – GIPTN** • Functional structure change of GIPTN, relating to the introduction of the NLTA. • Institutional assessment. • Operational planning. • Infrastructure, systems and operation design commenced. • Some industry discussions still occurred.

Source: Robertson & Aboo: 2016

The revised National Land Transport Act (2009), coupled with the guiding principles of the IPTN articulated by the Public Transport Strategy (2007), has a tremendous impact on the ability of municipal level government to initiate public transport initiatives. Local municipalities where an IPTN was to be introduced now served as the contracting authority of the system, this sped up the process considerably, allowed contract negotiation with new operators, and provided smaller cities access to the Public Transport Network Grant (Robertson & Aboo: 2016; NLTA: 2009). This strategy of creating a more inclusive approach to public transport development through the introduction of IPTN and the decision to involve paratransit operators was considered a bold move. The approach required a large administrative effort: business valuations had to be agreed to and conducted, operators had to become formal business entities, and contracts operating on a 12-year basis had to be agreed upon to complete the process (South Africa: 2009 & Roberston: 2017 Pers com). Under the NLTTA (2000), the types of negotiations that could occur between minibus-taxi operators and the authorities was limited; this changed with the policy reforms of the NLTA (2009). Consequently, negotiations continued for the George IPTN, with a second bout occurring in 2009–2010.

As Robertson argued, a major contributing factor to the successful commencement of operations in 2014, was the ability of the GIPTN to access the Public Transport Network Grant (Robertson: pers com 2017). This financial aid scheme has undergone several iterations over the years: first deemed the Public Transport Infrastructure Fund, it was subsequently renamed the Public Transport Infrastructure and Systems Grant, and later the Public Transport Network Operations Grant (Robertson: pers com 2017). This grant provided vital financial support for the ‘development, construction and operations of quality public transport systems’ (NLTA: 2009), including the preparations of various plans required by the reformed policy. Meanwhile, George, awaiting the introduction of the anticipated IPTN, chose not to update their integrated transport policy in 2012. Various exceptions were made to accommodate the operational changes, and issues including requests for new minibus-taxi operations and licensing delayed progress. Policy changes brought about by the introduction of the GIPTN in 2014 were assimilated with those of the Integrated Transport Plan in consolidating its objectives (South African Cities Network 2014)

CHAPTER THREE: METHODOLOGY

3.1. INTRODUCTION TO METHODOLOGY

BRT is an increasingly popular low-cost and flexible form of public transport and has been implemented in cities across the world, including Johannesburg and Cape Town in South Africa. Following regulatory reforms in 2007, smaller municipalities were encouraged to design and implement public transport systems to answer a demand monopolised by an informal paratransit sector, the minibus-taxi industry. The George municipality opted to implement an IPTN—a variant of BRT—which would work with the local paratransit sector. This paper explores the practicalities that shaped the design and implementation of this public transport system in George. To achieve this, this study considers the current literature on the relationship between contemporary trends in public transport and land use. It also argues that the socio-economic profiles of users in proximity to stations or stops is necessary for analytical clarity, and makes considerable use of spatial mapping to reflect the practical operation of the scheme in comparison to its design objectives.

3.2. SOCIAL PROFILE OF USERS

Census data is used to determine the population density, employment and distribution of average annual incomes in sectors of George. Although a general census was conducted in 2015, several of the areas examined depend on data from 2011. Where possible, the most up-to-date statistical date is employed.

3.3. ArcGIS AND ArcMap

GIS analysis is used to reflect the spatial realities of the municipal area, including economic decentralization and a network analysis. This has been achieved through recourse to ArcGIS and ArcMap. Data on the physical location of every interaction point between the public and access to the GIPTN is analysed through ArcGis; here, distance tolerances of 400m and 800m are included, as stipulated by IPTN policy. By considering this data in terms of the route network itself and not simply a straight-line distance from the station, the practical realities of access to buffer zones and corridors is illuminated.

3.4. PERSONAL INTERVIEWS

Personal interviews proved vital in clarifying the design objectives behind GIPTN. These interviews followed a loose and informal structure, this encouraged a more in-depth discussion of the scheme. Three interviews were conducted for the purposes of this paper:

I. Robby Robertson and Saffiyah Aboo met with me at their head offices Aurecon Cape Town on Monday, 18 September 2017. I was fortunate to have a chance to interview them at the same time. The Interview was loosely structured with discussions lasting a little over 1.5 hours. There was great insight to be gained from Robertson, who had lead input into the design and approach to implementation of the system and his efforts to optimize the model after it had begun operations. Aboo is a civil engineer and academic at heart – she gave very valuable insights regarding the structure and requirements of the policy and various areas where universal access compliance was a challenge.

II. An insightful meeting with Catherine Stone, the ex-head of Spatial Planning and Urban Design in Cape Town, who has since been giving input to the George MSDF. She provided insights as to the direction and considerations going into the compilation of the draft MSDF, and provided valuable information about the challenges faced in the integration of SDFs and the GIPTN.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1. THE HISTORIC MOTIVATION FOR GIPTN

George has seen significant increases in its urban growth and population density, which—together with spatial limitations—resulted in congestion. A traffic congestion problem is typically summarized by: multiple occurrences of decreased traffic movement, traffic accidents, peak hour crowding of public transport, the inadequacy of service often found at off peak times, pedestrian movement difficulties, large and typically negative environmental impact, and the associated parking difficulties (Pacione: 2001). Ultimately, these problems on a road network defeat the goals of transport and inhibit free movement and the transfer of goods and services vital to both urban and rural spheres (Roberston: pers com 2017). These problems were all notably present in George. An interview with a George municipal official who works closely with the compilation of their SDF, underlined the key motivations behind the implementation of bus transit system in the city. These included: the clear deteriorated state of a large majority of the existing MBT operator vehicles; the inability to police or effectively govern via a minimum operational standard; a consistently overcrowded service; a MBT dominant PT system perceived as unsafe, with sporadic violence between operators affecting passenger safety; irregularity of service; the failure of the MBT to address the needs and wants of users; the opportunity to assist those who could benefit from increased connection to key infrastructure; various environmental impacts associated with increased vehicle numbers and congestion; and, finally, the distortion of spatial planning objectives (George MSDF 2013 & Stone: 2017 Pers com)

While the historic motivations for the revamp of PT services in the area are relatively clear, it was the alterations to policy that truly allowed a project of this nature to be undertaken. Indeed, scholars like Walters, Behrens, Schalekamp attribute much of the current drive towards implementing IPTN systems in South Africa to a number of policy reforms between 1996 and 2009. Arguably, the characteristics of distinct VOC branding, reduction of operating costs through ITS cost optimizations, flexible fleet structures, and reduced operations costs, made IPTN the optimal choice. A further benefit of IPTN in the context of George, is that its operational nature would make use of and add immediate benefits to the corridor and nodal focus of urban development favoured in the municipal area from the early 2000s.

Another historic motivation for the Go George PT system is that it was one of the first times in which fully fledged negotiations took place between the MBT industry and the South African government. These negotiations tackled issues of participation, 12-year contracts and corporatization, as necessitated by terms of the NLTA (2009). This has been a highly valuable experience for both sectors as it has facilitated the flow of dialogue between parties. An advantage of this occurring in George, is that the number of affected parties is considerably less than the My-Citi (Cape Town) and Rea Veya (Johannesburg) operations.

In the past, the George SDF has acknowledged the vast importance of effective public transport management. This has been evident in the focus to create and foster the perceived benefits of having an effective IPT and eventually an IPTN. The SDF believes that an effective public transport system can assist the vast majority of urban poor through a reliable universal access compliant transport mode. The SDF and the public transport initiatives share common goals, most likely brought about through the process of the IDPs. These goals for include the achievement of equity as a priority (South African Cities Network 2014). Further benefits are key to the MSDF of 2013, namely: its demonstrated ability to aid the financial functions of an area, the ability to better control population growth, decreased cost in terms of funding, and the provision of manpower necessary for traffic control and policing (George MSDF 2013).

A look at the commuter split model for the city of George before the implementation of the GIPTN shows that 70% of the population did not have any access to private forms of transportation. The split shows that 45% of the population are pedestrian, 2 % made use of bicycles for mobility, while 24% made use of the available public transport (MBT) (Opendata.gov 2014). The Go George fleet has already proved its worth. When a series of raging wildfires tore through the region in June 2017 the Go George fleet arrived in the nearby town of Knysna to aid in emergency evacuations.

4.2. A SOCIAL PROFILE OF GIPTN USERS

The Eden district boasts the second largest district economy in the Western Cape after Cape Town. The district contributes a substantial 28% of the total GDP-R among the non-metropolitan districts of the Western Cape. The total population of George comprises 33% of the total population in the Eden district, with the latest population statistics estimating around 204,383 people currently residing in George (George Municipality: 2015). Population statistics for the area show an upward trend in population growth at a rate of 3.6% annually; this is much higher than the growth rate of the district as a whole, which sits at an average of 2.6% annually (Stats SA: 2011; WC Government: 2014). George has remained relatively on par with the Western Capes R-GDP, although estimates show that it is slightly lower than the rest of the district at 2.2 %. The population age split of George shows that 76.2% of the population is of working age (15-64 years); children (0-14 years) comprise 25.9% of the population, while and older (65+ years) residents constitute the remaining 6.8% (George Municipality: 2014; WC Government: 2014). The distribution of average annual income is illustrated in figure 4.2.1 below. The unemployment rate in George has shown a decreased between 2001 and 2011. As figure 4.2.2 (below) shows, the poverty rate in George is below the national average. In line with these trends, unemployment the poverty in the broader Eden District decreased between 2001 and 2010. The latest figures place the poverty rates at around 20.4% for George and at slightly higher 21.4% for the entire Eden district; this is highlighted in figure 4.2.3 (below) which shows the congruent decline of poverty rates in the district (Stats SA: 2011)

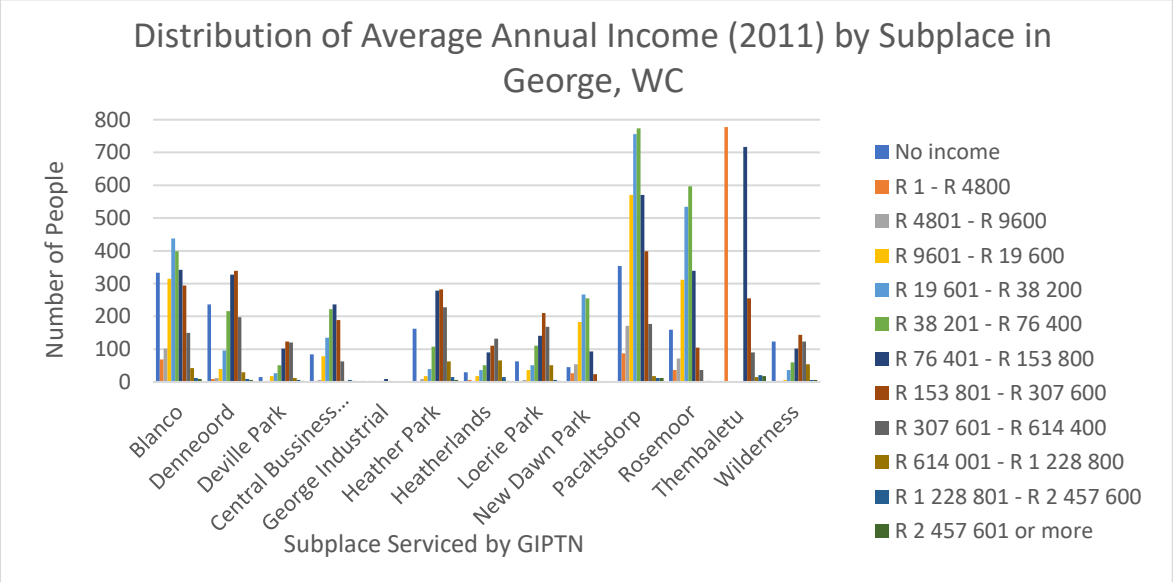
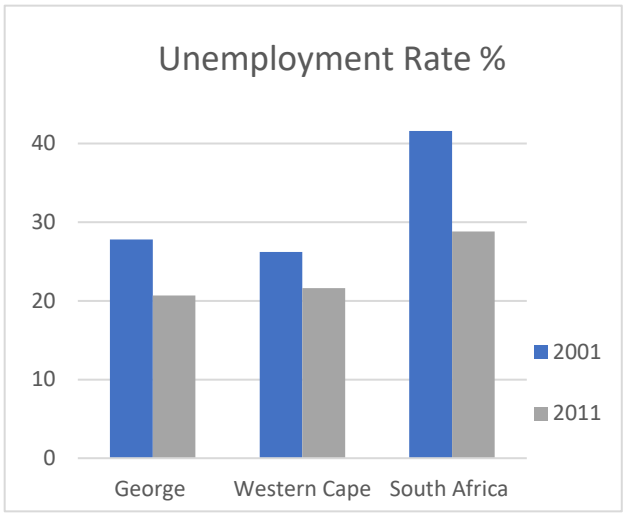
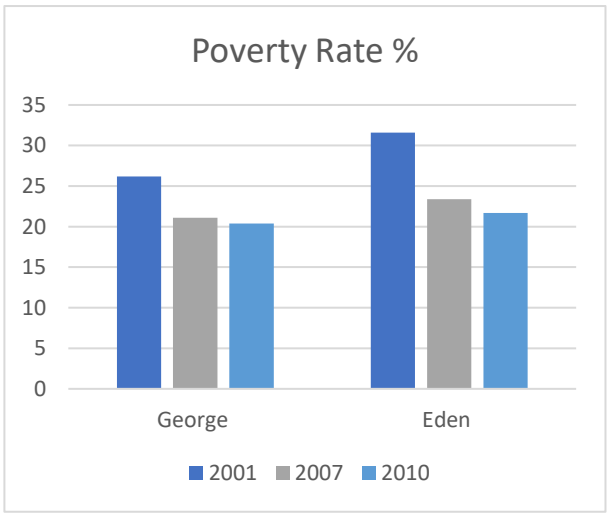


Figure 4.2.1: Distribution of Average Annual Income in George



Source: George Municipality: 2014, WC Government: 2014

Figure 4.2.2 Graph Showing Unemployment Rate

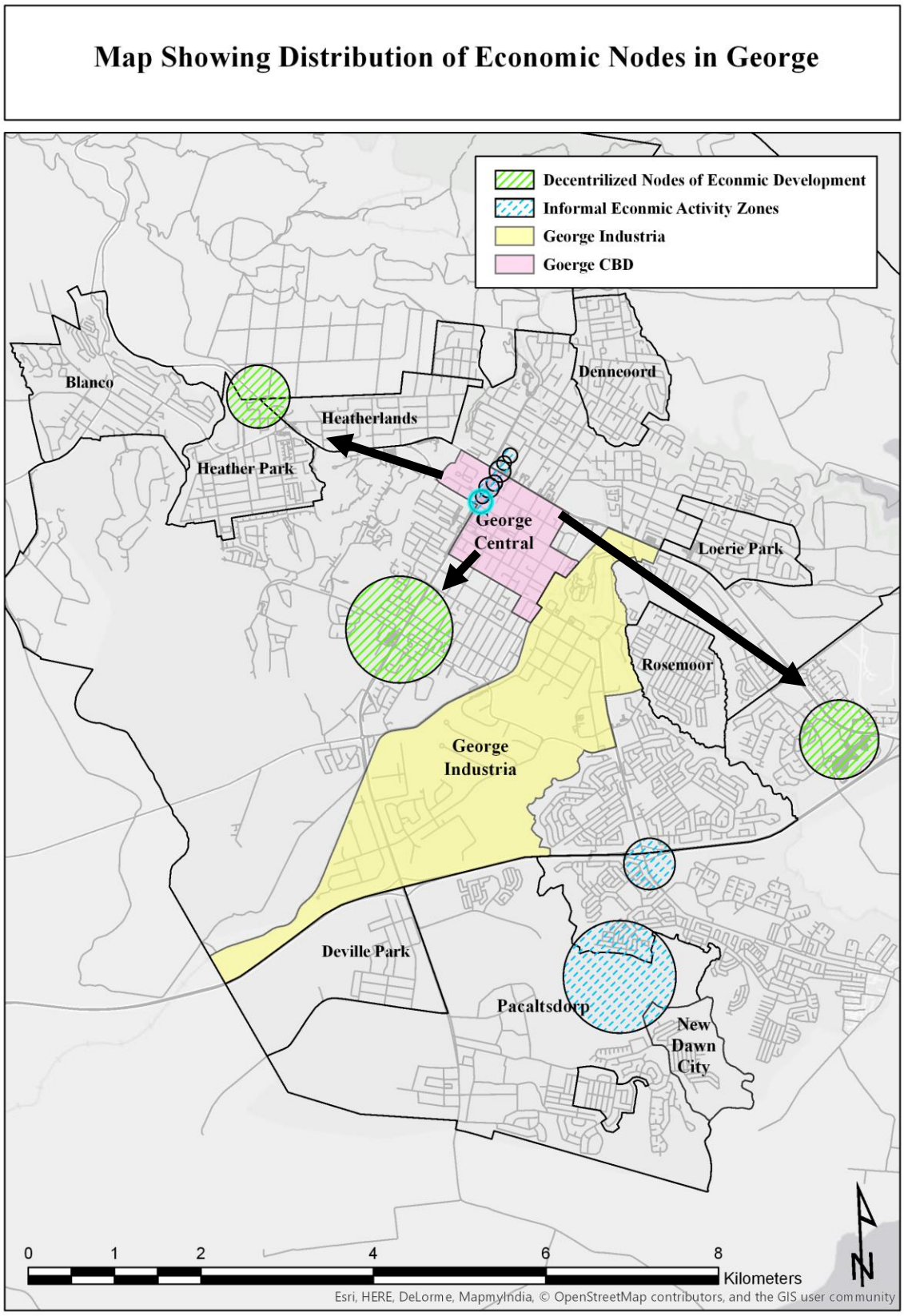


Source: George Municipality: 2014, WC Government: 2014

Figure 4.2.3 Graph Showing Poverty Rate

The GIPTN route network currently operates into and through several neighbourhoods in George. These neighbourhoods or sub places within the municipality are host to vastly different social characteristics. The following sections provide a further breakdown of the social profile of the sub places in George, focusing specifically on those sub-places in which the Go George Bus service currently operates. This means that the area of Thembalethu is excluded, as this area has been subject to persistent delays in the out of formal operations. The operations currently serve a number of sub places, namely: Blanco, Denneoord, Deville Park, the CBD, George Industria, Heather Park, Heatherlands, Loerie Park, New Dawn, Pacaltsdorp, and Rosemoor. It hopes to serve other areas, including Thembalethu, pending the release of phases three and four, as well as adjacent towns, like Wilderness, in phase five.

George has similar spatial characteristics to other South African cities. It is spatially dispersed; this is the result of past spatial policies that subjugated low cost housing projects to the urban fringe and other low-cost land parcels, often awkwardly located in relation to the CBD. (South African Cities network 2014). This is certainly the case in George where there has been the development of three district areas for formal business development. The CBD hub remains the primary business hub of George, and it not seen an increase in density to the point where limited ground space has forced development. Rather there has been a redevelopment of neighbourhoods immediately adjacent to the CBD, which were redeveloped into business zones, office parks and ideal firm locations. The second business node is the GRM, which opened in 2005 and has since developed on the peripheries of the urban edge and has decentralized much of the retail focus in the city. This has resulted in an increase in shopping center dispersal and vacancies in the CBD. Finally, substantial development has manifested along a corridor leading from the CBD towards Outdshoorn and the N2 national highway. A map detailing the locations of the spatial dispersal of the various sub places serviced by the GIPTN, including the general locations of the economic zones mentioned, is provided in figure 4.2.4 below.



Source: Author, adapted from SACN & George MSDF: 2013

Figure 4.2.4 Map showing the distribution of economic modes in George

In reviewing the social profiles of George, it is apparent that sub places continue to exhibit a high degree of segregation. The neighbourhood of Blanco, for instance, has a predominantly Afrikaans-speaking Coloured population (68.5%) and a relatively high population density of 3599.14 km^2. Although not located near each other, Blanco is demographically similar to Pacaltsdorp, although the general densities of the two areas differ greatly due to the divergence in size. Table 4.2.1 below summarizes the key demographic aspects of Pacaltsdorp and Blanco. Their demographic similarities are most likely due to the labour opportunities in these areas; many of those who live in Pacaltsdorp work in the industrial area which is ideally situated between it and the CBD. Blanco is a much higher density area; however, this may be skewed by the relative size of the Pacaltsdorp area, which is reserved but unused.

Table 4.2.1 Demographic profiles of Blanco and Pacaltsdorp in George

Basic Demographic Split of George Neighbourhoods		
	Blanco	**Pacaltsdorp**
Coloured	68.48	93.27
White	23.69	0.74
Black African	6.29	4.65
Other	1.09	0.73
Indian or Asian	0.45	0.60
Gender (%)		
Male	48.60	48.77
Female	51.40	51.23
Language (%)		
English	6.36	4.43
Afrikaans	88.13	92.20
IsiXhosa	2.95	1.69
Zulu	0.09	0.15
Area & Density (%)		
Area	2.52 km^2	10.19 km^2
Density	3599.14 km^2	1608.73 km^2
# of Households	2510	3804
Population	9087	16400

Source: Census 2011& Census GIS DVD 2002

There are three other predominantly Coloured neighbourhoods serviced by the GIPTN—Rosemoor, New Dawn Park and Deville Park. Rosemoor is located along the outskirts of George Industria, with most in this neighbourhood earning in the mid- to low-income brackets. Figure 4.2.1 shown earlier highlights the income distribution for the sub places serviced by the IPTN in George. This figure makes it clear that the areas of Blanco, Denneoord and Pacaltsdorp have the most similar income distributions. The middle- to upper-income groups are typically

Afrikaans-speaking and white, and located in the areas of Heather park, Heatherlands, Denneoord and Loeriepark. The demographic profiles of these neighbourhoods are shown in table 4.2.2 below. The areas show an increasing population density, with Heatherlands the least populated due to its location along the outskirts of George's urban fringe.

Table 4.2.2 Demographic profiles of Heatherlands, Heather Park and Loeriepark in George

	Neighbourhood		
	Heatherlands (%)	**Heatherpark (%)**	**Loeriepark (%)**
Coloured	4.4	3.58	3.87
White	90.66	93.19	91.68
Black African	3,14	1.74	2.23
Other	1.4	1.32	0.97
Indian or Asian	0.33	0.17	1.21
	Gender (%)		
Male	47.77	46.3	47.36
Female	52.23	53.7	52,.64
	Language (%)		
English	37.74	33.21	21,67
Afrikaans	58.74	63.66	76,39
IsiXhosa	0.81	0.31	0,34
Zulu	0	0	0,05
	Area & Density (%)		
Area	1.35 km^2	1.79 km^2	1.05 km^2
Density	1108.85 km^2	1608.72 km^2	1972.61 km^2
# of Households	556	1214	850
Population	1499	2877	2067

Source: Census 2011 & Census 2002 GIS DVD

The three areas above all show a white population exceeding 90% with Afrikaans as the main language and English as a second language; the areas also have a marginal number of other races and languages. The CBD and George Industrial district exhibit population numbers typical of these areas with the obvious lead in the number of commercial and industrial properties (Census: 2011). The social profiles of these districts reveal that in 2011 land use statistics placed over 900 commercial zonings in the CBD, with around 90 industrial land uses estimated for George Industria (opendata.gov: 2017) The delayed roll out of phases three and four have, as mentioned, lead to the exclusion of the Thembalethu population. This area exhibits a population of around living with little to no income. With an estimated population of over 45,000, and the highest density in the district (6637 people/km^2), it is clear why the

2003 Sandkraal Road Corridor Mobility Strategy targeted this population area. Thembalethu is the primary informal settlement in George and is made up of 93% black isiXhosa speaking residents, with only around 2,000 formal dwellings recorded in the area (South African Cities Network: 2014 & Stats SA: 2011)

The South African Cities Network study on George highlighted that in general the post-apartheid urban structure is one which sees four major trends or processes as a result. These four processes are: (1) the dispersal of economic zones, (2) urban drift, (3) differentiation and (4) decentralization (South African Cities Network: 2014). Decentralization is the process by which there is a general economic shift away from its original areas of activity towards suburban growth nodes and in many cases, as is the case in George, to the urban fringe. This development leads to primarily dispersed economic centers and results in divergent development streams with very little spatial consolidation in planning. Economic drift has since been noted in George, with data showing a large number of shop vacancies in the CBD and a rapidly growing economic and retail hub developing in the form of the GRM (George MSDF 2013 & South African Cities Network: 2014)

4.3. GIPTN: A CLOSER LOOK

It is evident through the interviews conducted for this paper and the various forms of literature consulted, that the GIPTN is unique both in the way it was implemented and in its designed (Robertson 2017: Pers. com) The GIPTN's is the adoption of an infrastructure light approach, this is much different to approaches evidenced elsewhere in South Africa and is possibly one of its biggest assets. This section aims to briefly explore the defining elements of the My Citi IRT in Cape Town to emphasise the unique aspects of GIPTN. In looking more closely at design the GIPTN, this section discusses its shared operational procedures, the financial context of the project, its general route and network structure, as well as its effects on the approaches of spatial planning in the municipal region.

According to Robertson (2017: Pers. com), the 'infrastructure light' approach was adopted for two main reasons. Firstly, the lack of initial funding, together with a largely unproven market to inspire private investor backing. Most of the available funding was being used to purchase vehicles for operation, as well as to compensate the large number of MBT vehicle operators.

This left very little available funding for the infrastructural upgrades needed to implement a 'full' BRT system. The second reason for this approach was of the general uncertainty as to how negotiations with the existing MBT industry would pan out in the future. In adopting this 'light' approach to infrastructure, the project negated the need for sizable amounts of fixed infrastructure, which would have gone to waste had the scheme had failed (Robertson & Aboo 2016).

The 'infrastructure light' approach is much different to the way in which the My-Citi IRT in Cape Town and Johannesburg was developed, with both cities implementing conventional full-scale IRTs. As Allen (2013) has noted, Johannesburg's Rea Veya BRT service was the first full-scale BRT system to operate in Africa. Operation of these systems is dependent on specific infrastructure, including bus only lanes, distinguishable curb markers, and transit boarding stations—all of which add to the overall cost of the scheme. After initially struggling to gain traction when it was rolled out in May of 2010, the My-Citi IRT is now operating out of over 42 stations along more than 30 routes—this constitutes a network made up of more than 300 stops. The service operates from 5:30 am to 21:30 pm daily, with frequent off-peak services running to ensure riders are always catered for. The My-Citi operations include level boarding platforms, which allow for much easier boarding and access for disabled users while speeding up boarding times significantly. This is one of the major advantages in the implementation of the GIPTN, as limited municipal funding meant that George simply could not afford to invest in such infrastructure (Robertson and Aboo 2016).

A private company, George Link, is currently the VOC in charge of the bus service for the GIPTN. The contractual relationship between the VOC and the contracting authority—George Municipality—was signed on 8 December 2014. The primary incentive here is that the financial success of the GIPTN goes directly to shareholders, which is composed entirely of investors from the compensated local MBT industry (Go George 2017). A register further ensures that people who are affected by the operations of the new transit system become favoured candidates for employment by the company itself. However, this is not to say that the path has been easy—the sector is still feeling the brunt of negotiation woes, which resulted in persistent delays in its roll out (Walters 2014). The implementation of the My Citi IRT benefitted tremendously from the establishment of a transport authority, which helped set up a governance structure able of handling the intricacies of integrated intermodal transport. A large effort has been made in the case of Cape Town to drive corridor development through the

introduction of the IRT, a focus that sees TOD as the dominant approach to current and future spatial policy orientation in relation to the My-Citi network. In terms of fare scheme, the IRPT makes use of a stepped- distanced based fare system. While this system was only implemented in late 2013, it allows for distance-based pricing to be applied using EMV cards, with price caps applied to a maximum fair beyond certain distance thresholds. This has allowed for the running of discounted ticket prices during off peak intervals, thus increasing the ability of users to access consistent, reliable and timely transport (City of Cape Town ITP 2017)

4.3.1. GIPTN Operational Overview

The operational characteristics of the GIPTN and the My-Citi IRPTN are similar in several respects, due in large part to their shared guiding policy framework mandates. These include the use of a flexible fleet as well as operations that make use of an ITS, cost optimization models, and the provision of a demand responsive service. However, due to financial and infrastructural constraints, the GIPTN had to be creative in its approach to implementation and achieve the best performance out of the transport network. The approach to implementation in by stages is not unlike that of the My-Citi model. Robertson (pers com 2017) argues that this stage-based approach is provides the greatest chance for the operational success of these systems; this is due to the ability of the first phase to promote the viability of scheme to both the local government and potential shareholders. This positive climate has been shown to draw passengers from other modes of transport (Behrens Schalekamp and Rodgers: YEAR). However, intermediate South African cities have a bottleneck in expendable capital—this is apparent in George Municipality, which decreases their ability to bolster fare revenues, ensure better operations and ultimately gain the trust and favour of commuters using other modes of transportation.

The infrastructure light approach is a unique characteristic in the design and implementation of the GIPTN. In an interview with planner and engineer of the GIPTN project, the various challenges in the approach and the ways in which the staged roll out benefited the operation of the system were explained. The first phase of the GIPTN saw a focus on pre-operation infrastructure; while this entailed a degree of small-scale construction and infrastructure installation, these where dispersed (Robertson: 2017 Pers. com). Infrastructure, as noted through this paper, is considered essential to effective operation of the bus-based public transport system, this includes the building of depots, the strengthening of roads for buses, the

widening of certain junctions to accommodate large vehicles, as well as features like traffic circles. Phase two operations saw roll-out infrastructure being added to the first phase—infrastructure was often to accommodate changes in the system design discovered during phase one. However, the main focus during this phase was to place greater attention on the infrastructure and revenue costs and identify ways by which operational efficiency could be bettered (George MSDF 2013; Stone 2017: Pers com).

4.3.2. Compensation and Financing Structure

Like all recent bus orientated PT projects in South Africa, the GPTN has seen significant obstacles in the form of administrative and financial limitations at the local level, with poor institutional capacity to effectively manage the financial and logistical aspects of a project of this scale. While provisions of financial aid are granted by the state in terms of the PTNOG, much of the responsibility still rests on the shoulders of the Bus Operating Company, the George Municipality and the Western Cape government to ensure operational costs are sustainable. In terms of compensation scheme chosen, there were two initial considerations—route-based or equal rights based. As mentioned in previously, the geographic extents of George continue to demonstrate high degrees of racial segregation between neighbourhoods. Due to this unevenly distributed population, a route based approach to compensation was considered, but this might result in the racialization of the compensation scheme. Consequently, an equal rights compensation scheme was proffered, this entails compensation distributed by area rather than by route.

From its inception, the amount of grant funding available has been far less than the estimates required by the GIPTN. The graph below—figure 4.3.1 below—highlights the decreasing amount the Go George service has received from requests for grant funding. Broadly, the results show that the GIPTN has become more cost efficient while at the same time boasting higher ridership levels capable of decreasing the degree of dependency on grant funding, as illustrated in figure 4.3.2 below.

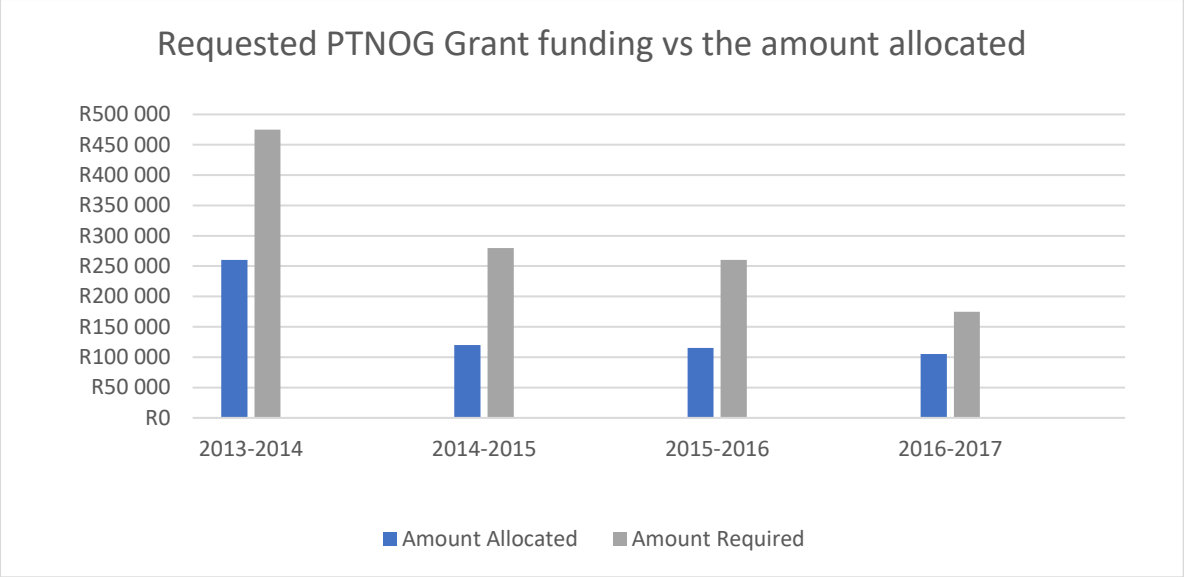


Figure 4.3.1: Graph Showing the amounts of grant funding requested to the amount eventually allocated Source: Go George 2017

The GIPTN has focussed on creating a fare structure which takes the average wage of domestic labour per hour into account, this sees the costing structure make use of a QOL indicator to gain a better understanding of what fair would be most acceptable for the riders. This costing structure allows the bus system to address the socio-economic challenges in their environments.

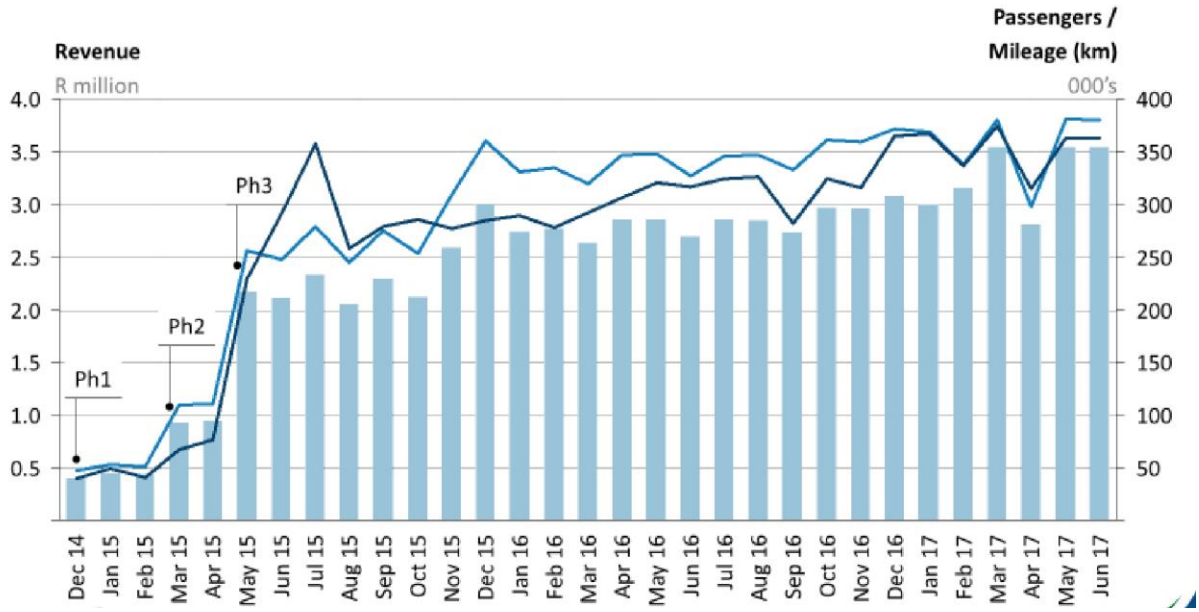


Figure 4.3.2: Graph Showing the increase in GIPTN ridership over time

Source: Go George: 2017

The operational success of the GIPTN has also been marred by conflict riddled negotiations with the MBT, as well as large amounts of vandalism to its infrastructure and buses. However, there is a clear steady uptake of new riders since its introduction.

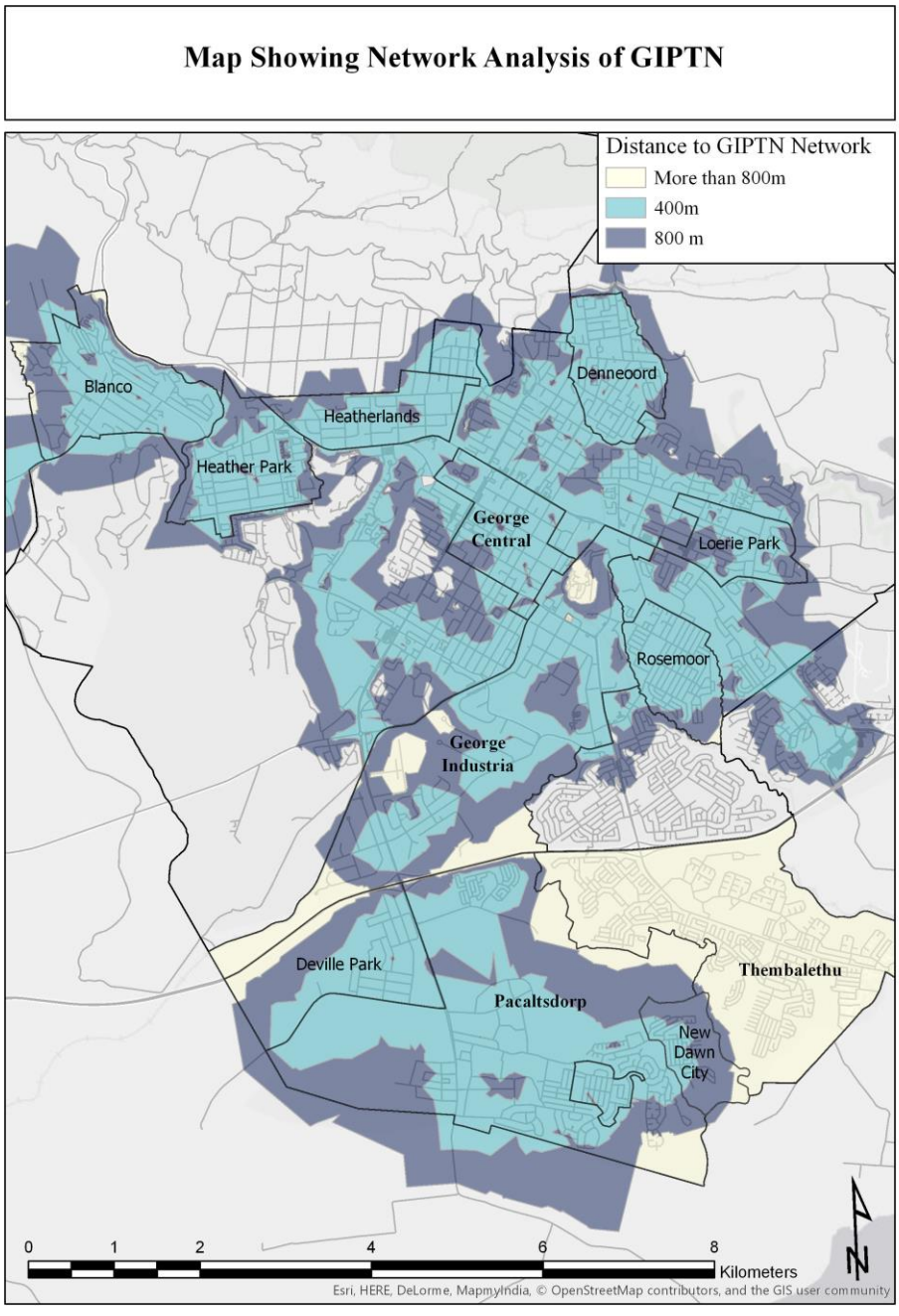
4.3.3. Route Structure and Network

The GIPTN route structure stretches both the built urban environment and the PT mode services to the immediate rural environments. Roberts argues that the network is designed in such a way that with the implementation of each phase there are design changes which help to better establish efficient and cost-effective service operations. The phased roll out of the GIPTN began in the December 2014, with system expansion over a 6-month period to areas including Rosemoor, Loerie Park, Denneoord, Blanco, Pacaltsdorp and the CBD. Despite intentions to roll out service routes to Thembalethu and Wilderness, the implementation of phase four remains delayed by failing negotiations with the MBT industry.

The network structure consists of main routes between primary residential and service areas services, with links to the rural areas as well various inter town services between George and its neighbouring towns of Knysna, Outdshoorn and Mosselbay. The entire network serves 28 routes, with plans to expand these in phase 4. The overall targets of the IPTNs and the GIPTN has been to generate a network that would effectively cover around 85% of the built urban environment, with the objective of making the network accessible from anywhere within buffers of 400m and 800m. To cope with the vastly different road classes in George, as well as to efficiently manage demand, the GIPTN chose to employ a mixed fleet approach; this entails differentiating the type of vehicle best suited for the demand and task. In some cases, the extremely informal nature of certain neighbourhoods has resulted in periods where buses have been unable to operate effectively. When introduced, the inter-town bus services are expected to operate on a reciprocal schedule. Through this method, PT systems in the neighbouring towns can be shared to a certain degree between the three linearly organized towns.

A Network analysis was performed on the go George transports network, which was set up using SDF defined buffers. However, different to a circular buffer applied generally around the points of bus stops, this network analysis takes into account the structure of the road network and calculates every point on a network that is covered within a 400m radius of the network or

a short 5-minute walk. The second buffer shows all points that lie within 800m of a bus stop. The network for the most part covered the built extent of George with small areas where the network is incomplete toward the CBD of George. Furthermore, this map—figure 4.3.3. below—highlights the spatial extent of Thembalethu in relation to the size of the George PT network.



Source: Ackermann 2017

Figure 4.3.3 Network Analysis of GIPTN

4.4. LAND USE AND THE DESIGN OF THE GIPTN

It has been shown that there are a number of significant benefits to BRT type models, these benefits are highlighted by Currie (2006) who notes that the effects of the transport system are not only limited to inspiring development, but that these systems can actually aid mixed-use, high density land development policies in the achievement of their goals. This in the scope of the My-Citi approach and is clearly manifested through their adoption of TOD (CT ITP 2016). Evidence provided by interviews conducted indicates that spatial planning was not addressed as an issue before design or implementation phases. Rather forward planning or land use change was allowed to develop organically within the context of mandates of the general SDF guide lines—concentrating on economic nodes, the development of economic corridors, and the adjustment of spatial challenges produced by the apartheid city model (Robertson :2017 pers.com).

A number of infrastructure upgrades have been undertaken within the George area as a result of the IPTN's implementation, including numerous road rehabilitations schemes with roads such as Nelson Mandela Boulevard (previously known as Sandkraal Rd) and the Merriman roads requiring urgent upgrades. Various upgrades, repairs and the installations of terminals, transfer stations and various interchange points have occurred; these are estimated to have cost around R34 million, spent on over 50 projects in around the GIPTN. This has also included improvements to over 700 bus stops, including the design and installation of these in around 250 high density commuter collection points; this has been done with to deal with the stress of peak CBD PT congestion. Numerous sidewalk upgrades are also being undertaken, supporting the pedestrian movement to the main bus route servicing residential areas. There has been mass investment into the management of traffic services including new traffic signal installations and repairs (George MSDF: 2013 & Stone 2017: Pers com).

There is a generally low level of forward spatial planning with regard to land uses in both the design and implementation of this project. While the infrastructure development phase (1) was underway for the GIPTN, the only rezoning that occurred was the change in the property rights where the bus depot was constructed. In the context of the GIPTN, land use change has been solely done for the location of the required facilities. Robertson (pers com 2017) notes that future developments are currently in the works, one such development plans to ultilise land parcels, currently unused because they have been reserved as an environmental setback. These

could possibly be rezoned and developed as a residential equivalent; however, as it runs along the Blanco Corridor, a higher density mixed-use application would be ideal to suit the spatial objectives of developments situated around a PT corridor. The proposed development hopes to make use of strong PT partnerships and instil valuable pedestrian friendly elements (George MSDF 2013; Stone: 2017 Pers com)

A significant hindrance to the spatial framework is that it has yet to reflect and implement the grand visions of the NLTA at a municipal level (2009). Furthermore, both IPTN 2032 and the MSDFs that where being employed in George in years prior to the development of the GIPTN, have stuck to closely to the broad spatial polices found the in metropolitan regions (Robertson & Aboo: 2017).

4.5. THE CURRENT SPATIAL PLANNING POLICY AND LAND USE

The functions of an SDF in terms of land use, planning and management are similar to that of other SDFs in neighbouring areas. Arguably this could be due to the spatial goals of an overarching plan, which are actualized through an adherence to sometimes ambiguous mandates and at times irrelevant policy directives and a spatial policy. This is in many ways quite ironic, since one of the main spatial goals is to promote development which takes factors of functionality into account. The SDF is ideally aimed at guiding and establishing the overarching approach to spatial planning in an area, this document however has no specific authority to give or remove land use rights. This function falls to the integrated municipal zoning scheme. This scheme aligns the spatial priorities designated in the MSDF with that of the land use regulations (George Municipality: 2011 & George Municipal Spatial Development Framework: 2013).

The most current version of the George MSDF highlights these overarching spatial objectives:

1. The goal of not only restructuring but further reconnecting the fragmented urban fabric, following objectives of renewal within the current public transport scheme. Corridor and nodal developments remain at the heart of the project.
2. The SDF aims to create a greater climate of economic resilience in the city. This is a target deemed achievable through the strengthening of overall economic vitality in the

area. A focus on the ability of the local economy to remain resistant to an ailing macro-economic climate.

3. The creation of quality living environments aims to incorporate the management of urban growth, the hierarchy of the various economic nodes (previously highlighted by making use of the vacant land parcels in strategic locations to increase the demands for development), the densification of urban nodes, and the rejuvenation and development of organic and 'augmented' activity corridors.
4. The fourth objective of the local MSDF is thus to ensure the protection of environmental integrity of urban spheres—creating an open space environment, which can foster functionality while remaining mindful of critical biodiversity. These goals are to be achieved through the application of spatial planning principles though best to guide, manage and encourage development according to environmental targets.

The GIPTN is a project with far reaching impacts, the above mentioned spatial objectives mentioned all are impacted by the development of the PT system. While the first and second goals deal with the effects of the GIPTN considered is considered a mechanism through which these objectives can be realised. The 3rd objective aims to deal with the densification of corridors and the management of urban nodes, this does not represent a substantial change in objective of the Sandkraal Rd Mobility Strategy. While it is pointed out that at the same time and as shall be shown later in this paper, the goals of this project to a large extent have today still not been realized. One could argue that the rejuvenation strategy initiated in 2003 was replaced by the grand vision of an eventual town wide IPT operation, has to a large extent lost sight of its original intention and still unable to exploit the known socio-economic benefits of corridor development through an active economic corridor, because of continued delays in phase 4 infrastructure and routes.

George's MSDF highlights these various spatial characteristics as paramount to preserving and fostering. George has a structure which is well developed, established and diverse, providing number of economically active zones in and around the urban sphere, these can be exploited foe opportunities, there has been a gradual shift of economic activity away from the CBD toward the area of Thembalethu, this could be linked to transport difficulties as people would ideally travel the shortest path to get a common good. One of the spatial focusses in the SDF is that on the physical barrier created by the retail development node creating a large spatial barrier between the poorer more southern communities in the south extents of George with the

more wealthy, northern halve of George. However, a strategy listed in the MSDF highlight plans to support the greater use of valuable land which is predominantly unused land in the proximity of the various N2 intersections to better improve the access from these areas to the CBD, this supporting more mixed used development. Furthermore, a spatial strategy at current offers support to developments which support public transport, as opposed to the private car.

Through the SDF – there is also the aim of supporting the establishment of intense economic nodes- specifically in locations strategically places to integrate the dispersed George city structure. Rather than stipulating land use changes prior to development- the current MSDF allows for generally higher densities and mix land use development along principle GIPTN routes. The spatial challenges then faced by George are not universally different to that of other intermediate sized countries in South Africa, interventions in spatial planning currently are necessarily driven, but rather incentivized to a degree. More direct approaches have been adopted in the Metropolitan example, with a clear focus of spatial planning leaning toward Transit Orientated Development ().

Currently the MSDF (2013) assists in through a series of guided interventions, from the densification policy, corridor development, addressing the housing issue, further accommodating for the growing sector of the gap housing market- and the concentrating efforts at integrating them through identified and planned or supported nodal developments, through the link with the GIPTN (MSDF 2013; Robertson pers.com 2017 & South African Cities Network 2014).

Thus, the SDF is engaged in an attempt to guide the restructuring the complex urban fabric, integrating the populations split to the north and south of the N2 highway, hereby creating a larger space economy. Attempt to make use of the implemented IPTN to control to the extents of urban sprawl which consumes vacant land. Land that could be restructured as natural or agricultural assets, this added through the provision of an effective public transport system which has an adjacent high-density mix land use zone. Attempts to rejuvenate the CBD of George and further strengthen its hierarchy between other economic nodes once again to negate the effects of dispersal and lastly to integrate the opportunity rich- wealth populated areas of George such as Heatherlands, Heatherpark and Loeriepark to those poorer more disconnected areas such as Pacaltsdorp and Thembalethu through public transport.

The benefits of the GIPTN are expected to be evident in a number of difference ways, Cathy Stone, who is the ex-director of spatial planning at urban design in the City of Cape Town, now working on completing the refreshed draft SDF gave valuable insights as the various positive impacts which have come about through implementation of the system, in Industry, for example has seen the development of skills with greater employee benefits. In terms of business, there has been an increase in the number of job opportunities as well as seeing positive business development. To the public the benefits are the access to a reliable and safe PT system, greater access to various social and economic activates and the creation of more liveable connected urban landscapes.

Lastly, the Expanded Public Works Program (EPWP) too draws benefits from the construction and installation of the infrastructure for bus operations- these include the bus stops, the PT vehicle depot and various areas for storage, the upgrading of community route to handle the increased bus loads, giving greater access to not only service vehicles, but also further aiding the predestination of the urban sphere

4.6. DEVELOPMENTAL RESPONSES TO GIPTN

The short-term indicators of development as a result of the GIPTN is nascent at this stage of the rollout. While George has most likely seen many short term and immediate development orientated responses, current land use data at the sub place level is only available for 2011—that is prior to the implementation GIPTN. Looking forward it can be expected that development responses will become more visible in coming years.

In conversation with Robertson and Aboo (2017) they hinted toward a possible increase in foot fall for the Garden Route Mall after the service was expanded to this dispersed, but highly popular commercial node in 2015. A trend analysis on the foot fall data from the start of 2012 to June 2017 yielded inconclusive results. While it did seem to show a decline in foot fall traffic through the mall in 2015, this was likely to have been skewed by the opening of another commercial centre—the Eden Lifestyle Centre—nearby (GRM: 2017).

What is has become apparent through interviews with influential role-players in both the George SDF and Go George PT, is that the hopes of GIPTN are slowly being realized.

Moreover, the potential for development opportunity to be realised is increasing as the project proves itself both functional and sustainable. Robertson argued that, as in the case of the infrastructure light approach, the choice to implement GIPTN over a series of phases was predicated on being able to showcase the project and its possible effects on the urban environment in drumming up investor confidence and potential shareholders, as well as solidify rider support, whilst creating an environment in which spatial development goals could be achieved.

4.7. INCREASING DEVELOPER INTEREST

Increasing developer interest in the GIPTN is clear—there are several proposed development sites, including Cradock street precinct, for example. Figure 4.71. below is an image of a proposed redevelopment of the site. As you can see the site shows a strong PT connection with a pedestrian focus. Another visionary reimagines the York Street corridor with guide development of the road reserve in a multi lane fashion, this includes a slow moving central traffic flow with large trees—canopies greater than 3 metres in width stretching over broad, multifunctional pedestrian orientated walkways. These guidelines recommend that paving is done to link the curb line to the building line, and that pedestrian crossings are ideally located at the cross-street intersections. This shows the clear intentions of both the Transport Plans and Spatial plans to prioritize PT and Pedestrian traffic

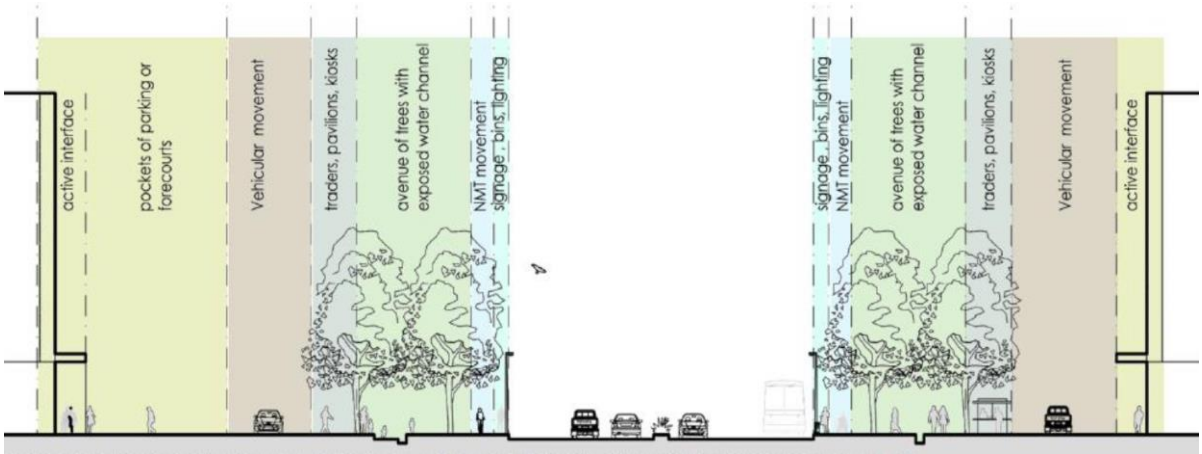


Figure 4.7.1: Cross section of proposed new George Corridor Street Scape

Source: Go George: 2017

This cross section shows the dynamics of a streetscape with dedicated zones for various types of transport modes. Evidently, a primary goal of the vision is to free the movement of pedestrians. The pedestrian-first approach to urban development will hopefully address the challenges faced by residents of George, which has a high pedestrian percentage in its commuter split.

There are also is plans in place to rejuvenate and develop a section of the Thembalethu Nelson Mandela Bay intersection. This redevelopment would include a new facility for the GIPTN to operate on this site, granting access to developments with setbacks that are ideal for the free movement and the pedestrian environment. Figure 5.7.2 (below) shows this intersection design and how it incorporates more physical infrastructure to support the IPTN. This shows the intents not only of developers to take part in these projects, but to large extent the aims and goals of those working in the design and planning department of the Go George Network. These plans are shown in figure

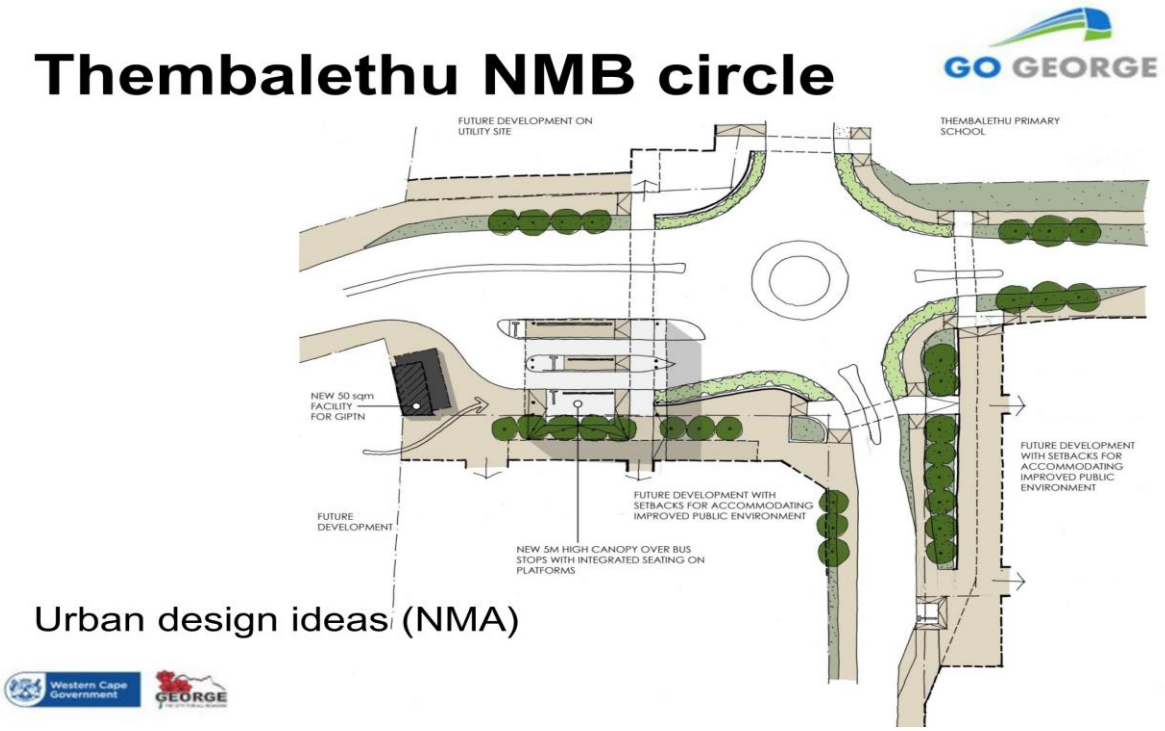


Figure: 4.7.2 Possible future PT orientated designs for the GIPTN

Source: Go George 2017

CHAPTER FIVE: CONCLUSION

5. CONCLUSION AND RECOMMENDATIONS

According to Pacione (2009), BRT systems outperforms alternative transport systems, especially when it comes to cost-efficiency. In the Global South, the roll-out of BRT has been particularly popular due to its efficacy. The evident success of BRT has been complemented by praise from academics and policy-makers who note the time-saving, health and safety benefits of the scheme. However, this is not entirely the case in South Africa. Due to the investment and focus of upgrading repairing and developing infrastructure for the 2010 Fifa World Cup the BRT systems have been rolled-out somewhat hastily. The deep socio-economic issues rooted in South Africa's apartheid past the accessibility of BRT systems to the poorer populace (arguably those who need it the most) has remained scant to a large extent

Nevertheless, BRT type models are considered as an immediate, practical and affordable solution to traffic problems, especially when considering the high cost of investment required for other MTS such as that of rail transit. In George, further attractive incentives to the implementation of the project was that it would by inherent operational nature make use of and add immediate benefits to the corridor and nodal focus of urban development from the early 2000s

The GIPTN route network currently operates into and through a number of neighbourhoods in George, these neighbourhoods or sub places within the municipality are host to vastly different social characteristics. To this extent attempts at creating a city for all social classes (and in the process eliminated some of the indecencies of the apartheid past) has been probed at with the implementation of the system.

A hindrance, however, as in most circumstances in South African Governmental sectors, remains the financial and managerial administration. While provisions of financial aid are granted by the state in terms of the PTNOG, much of the responsibility still lands on the shoulders of the Bus Operating Company, the George Municipality and the Western Cape government to ensure operational costs are sustainable. The current spatial planning initiatives in the municipality do not take full advantage of the newly introduced system, however it is clear that there is a renewed sense of hope for the transport and development landscape of

George. Lessons that have been gained from the GIPTN could be applied to many intermediately sized South African cities. However, it is kept in mind that situational context often is the biggest defining characteristic to the approach and strategies to implementation. To this end this paper argues that to a large extent the connection between spatial planning and transport have seen a disconnect in regions like George, due to the implementation of spatial planning practices in years previous which have rather mimicked the practices of large metros, this however is set to change with greater attention being afforded to planning with PT in mind.

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APPENDICES

Appendix A: Ethical Clearance

UNIVERSITEIT STELLENBOSCH UNIVERSITY

NOTICE OF APPROVAL

REC Humanities New Application Form

23 August 2017

Project number: GEO-2017-0969-585

Project Title: Go George BRT: Analysis of land use change since implementation and associated socio-economic outcomes.

Dear Mr Chad Ackermann

Your REC Humanities New Application Form submitted on 10 August 2017 was reviewed and approved by the REC: Humanities.

Please note the following about your approved submission:

Ethics approval period: 23 August 2017 - 22 August 2020

Please take note of the General Investigator Responsibilities attached to this letter. You may commence with your research after complying fully with these guidelines.

If the researcher deviates in any way from the proposal approved by the REC: Humanities, the researcher must notify the REC of these changes.

Please use your SU project number (GEO-2017-0969-585) on any documents or correspondence with the REC concerning your project.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

FOR CONTINUATION OF PROJECTS AFTER REC APPROVAL PERIOD

Please note that a progress report should be submitted to the Research Ethics Committee: Humanities before the approval period has expired if a continuation of ethics approval is required. The Committee will then consider the continuation of the project for a further year (if necessary)

Included Documents:

Document Type	File Name	Date	Version
Research Protocol/Proposal	Research Proposal	10/08/2017	
Informed Consent Form	consent form CA	10/08/2017	
Data collection tool	Questionaire	10/08/2017	
Request for permission	Organisational Permission Letter	10/08/2017	

If you have any questions or need further help, please contact the REC office at cgraham@sun.ac.za.

Sincerely,

Clarissa Graham

REC Coordinator: Research Ethics Committee: Human Research (Humanities)

National Health Research Ethics Committee (NHREC) registration number: REC-050411-032.
The Research Ethics Committee: Humanities complies with the SA National Health Act No.61 2003 as it pertains to health research. In addition, this committee abides by the ethical norms and principles for research established by the Declaration of Helsinki (2013) and the Department of Health Guidelines for Ethical Research: Principles Structures and Processes (2nd Ed.) 2015. Annually a number of projects may be selected randomly for an external audit.

Appendix B: Permission Letter

UNIVERSITEIT•STELLENBOSCH•UNIVERSITY
jou kennisvennoot • your knowledge partner

STELLENBOSCH UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

You are invited to take part in a study conducted by Chad Ackermann and Anele Horn (supervisor), from the Centre for Regional and Urban Innovation and Statistical Science at Stellenbosch University. You were approached as a possible participant because of the intimate knowledge you might process of the Go George IPTN.

1. **PURPOSE OF THE STUDY**

Title: *Go George PT: Analysis of land use change since implementation and associated socio-economic outcomes.*

The study will specifically consider the forward planning initially undertaken by the George local authority to determine the exact location and operation of the GIPTN, what the current planning policy says regarding the land uses adjacent to the GIPTN as well as the socio-economic profile of users in closest proximity to the stations or stops. Studying the GIPTN's planning, expectations and roll-out would give much greater contextual evidence for future implementations in similarly structured cities and towns around South.

2. **WHAT WILL BE ASKED OF ME?**

If you agree to take part in this study, you will be asked to please answer to the best of your ability a short list of open ended questions surrounding the Go George PT system and the general thought in planning practices which surrounded its implementation, especially those in regard to spatial planning.

3. **POSSIBLE RISKS AND DISCOMFORTS**

There are few foreseen risks or potential discomforts, if perhaps there are questions you cannot answer or do not want to answer due for any reason you are well within your rights to not answer the question without negative comment or feedback of any kind. No questions are directed at you in a personal capacity

4. **POSSIBLE BENEFITS TO PARTICIPANTS AND/OR TO THE SOCIETY**

This study in general could help explore problems or benefits of this model's implementation, especially since the size of the scheme is one of the smallest in the country and as such must develop its own unique work arounds to certain challenges.

5. PAYMENT FOR PARTICIPATION

6.

There is unfortunately no remuneration offered.

7. PROTECTION OF YOUR INFORMATION, CONFIDENTIALITY AND IDENTITY

Any information you share with me during this study and that could possibly identify you as a participant will be protected. This will be done by interview data is stored on a password encrypted drive to which only I have access, the recording of the interview, will be transcribes into text and then further deleted, with the text data kept on the same encrypted hard drive.

No information will be shared with any 3rd party.

The participant reserves the right to allow a recording, and may choose to have an unrecorded interview if they so wish.

Confidential integrity will be maintained throughout the research, synthesis and if lucky enough publication processes, at no point will any confidential or sensitive information be released. Information will be deleted once final synthesis is complete as well as transcriptions have been accurately recorded.

8. PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you agree to take part in this study, you may withdraw at any time without any consequence. You may also refuse to answer any questions you don't want to answer and still remain in the study. The researcher may withdraw you from this study if at any point you so wish to discontinue.

9. RESEARCHERS' CONTACT INFORMATION

If you have any questions or concerns about this study, please feel free to contact *Chad Ackermann* at *0760255969* and 17133459@sun.ac.za /or the supervisor: Anele Horn at *Anelehorn@sun.ac.za* .

10. RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research participant, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

DECLARATION OF CONSENT BY THE PARTICIPANT

As the participant, I confirm that:

- I have read the above information and it is written in a language that I am comfortable with.
- I have had a chance to ask questions and all my questions have been answered.
- All issues related to privacy, and the confidentiality and use of the information I provide, have been explained.

By signing below, I Safiyyah Abw agree to take part in this research study, as conducted by **Chad Ackermann**

Signature of Participant	**Date** 19/10/17

DECLARATION BY THE PRINCIPAL INVESTIGATOR

As the **principal investigator,** I hereby declare that the information contained in this document has been thoroughly explained to the participant. I also declare that the participant has been encouraged (and has been given ample time) to ask any questions. In addition, I would like to select the following option:

	The conversation with the participant was conducted in a language in which the participant is fluent.
	The conversation with the participant was conducted with the assistance of a translator (who has signed a non-disclosure agreement), and this "Consent Form" is available to the participant in a language in which the participant is fluent.

Signature of Principal Investigator	**Date**